



Integrated Functional Appraisal (IFA)

Genomics Division

June 30, 2003



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Executive Summary

The Environment, Health and Safety Division (EH&S) conducted an Integrated Functional Appraisal (IFA) of the Joint Genome Institute (JGI) Production Genomics Facility (PGF) in April 2003. The appraisal process involved the following steps:

- Identify and review the gamut of formal authorizations issued to the PGF (e.g., Activity Hazard Document [AHD], IB Satellite Accumulation Area [SAA], etc.), as well at those operations contacted under line-management authorizations.
- Examine the institutional Hazards, Equipment, and Authorization Review (HEAR) database to determine activities driven by formal authorizations, as well as other areas identified in HEAR that contained hazardous equipment, activities, and/or substances. Conduct a safety walkthrough of the physical spaces linked to AHDs, in addition to other administrative and laboratory venues controlled by the PGF.
- Conduct random safety-related discussions with managers and employees during the IFA walkthroughs.
- Review Supervisor Accident Analysis Reports (SAARs), accident rates, and study any trends identified.
- Identify employees working more than four hours at a computer workstation.

Participants in the IFA included technical specialists from the EH&S Division (Safety Engineering, Industrial Hygienist, Ergonomics, and Biosafety). A Department of Energy Office of Science Berkeley Site Office (DOE-SC BSO) observer was also invited as part of the IFA Team. Representatives from the PGF (Safety Coordinator, Operations and Facilities Managers) accompanied the walkthrough.

The IFA helped to validate that ES&H hazards resulting from PGF operations are effectively being identified, managed, and controlled. Continuous-improvement safety initiatives have been initiated, and workplace injuries/illnesses are being addressed through a strategy of implementing sustainable engineering controls.

- The work performed under formal and line-management authorizations was reviewed, and these activities are being conducted properly.
- Top management commitment is becoming more visible. The new Division Director took the initiative to issue a formal written safety communication (via e-mail) to the staff-at-large. Safety responsibility/accountability and hazard mitigation have been the emerging messages delivered by management.
- The Safety Coordinator position is becoming more integrated and interactive throughout the PFG operation and organizational hierarchy. The EH&S Division continues to service the Division by providing environment, safety, and health (ES&H) support through its Liaison Program, as well as technical subject matter experts as needed.

- PGF management took the initiative to schedule and enroll all of their managers and supervisors in a tailored EH&S 20 course (EH&S for Supervisors).
- The Division's ISM Plan was reviewed and revised by JGI-PGF management to reflect a more tailored approach in managing ES&H issues.

Over the past two self-assessment performance years, the Genomics Division experienced above-average total recordable case (TRC) rates that also involved a considerable number of days away from work and restricted workdays. Although the number of SAARs increased from the prior years' frequencies, the severity of the cases has lessened (no days away from work). This improvement reflects the commitment and safety management system in place to encourage early reporting and medical assistance. The types of engineering and administrative controls being used are also making a positive impact in eliminating recurrence of similar injuries. However, there may be challenges in the employee-relations area that require further assessment, because they may affect the injury experience/performance.

Opportunities for strengthening worker safety were also identified:

- During the IFA space reviews, the team encountered occasional safety issues requiring attention: housekeeping, seismic safety, lab safety, chemical labeling/storage, and workstation ergonomics. Many of these findings were quickly responded to and corrected.
- More involvement in periodic safety walkarounds by department heads, group leaders, and supervisors would create visibility and open up dialog between employees and management. Such ongoing efforts and visible presence help to engage workers in communication and feedback, as well as reinforce consistent safe work practices.
- A more robust system for supervisor participation in safety is needed. Some forms of job safety analysis (JSA), refresher course in SAAR investigation, and safety performance accountability are necessary to reinforce the importance of proactive oversight and management of workplace safety.

The management of sequencing systems and higher-hazard areas through the use of engineering controls continues to make some positive impact in addressing ergonomic risk exposures to PGF employees.

Table of Contents

<u>Sec</u>	ction			<u>Page</u>
1	Intro	duction		1
	1.1	IFA Pu	ırpose	1
	1.2	Scope		2
	1.3	JGI Mi	ssion Statement	2
	1.4	Progra	ms	2
2	Appr	aisal Pro	cess	3
	2.1	Team .		3
		2.1.1	Selection	3
		2.1.2	Member Roles and Responsibilities	3
		2.1.3	Meetings	3
	2.2	Develo	pping a Hazard Assessment Profile	4
3	Defir	ning Appı	raisal Areas	5
	3.1	Forma	I Work Authorizations	5
	3.2	Validat	tion of Hazard Identification Database (HEAR or Equiv	alent)5
	3.3	Line M	anagement ('Self-Authorization') Space/Operations	5
4	Find	ings		6
5	Note	worthy P	ractices	7
6	Cond	clusion		9

Appendices

- A. PGF Self-Assessment "At-A-Glance" Results, 2002
- B. Genomics HEAR Database 2003: Hazard Profile [Building 100]
- C. Genomics HEAR Database 2003: Hazard Profile [Building 400]
- D. Rooms Containing Hazards/Equipment Assigned to Genomics Division [Building 100]
- E. Rooms Containing Hazards/Equipment Assigned to Genomics Division [Building 400]
- F. Rooms Containing Ergonomic Issues Assigned to Genomics Division
- G. PGF I&I Experience (thru 6/30/03)
- H. IFA Technical Findings

1 Introduction

1.1 IFA Purpose

The Integrated Functional Appraisal (IFA) component of Berkeley Lab's Self-Assessment Program provides a technical occupational safety and health review of division work and is designed to help meet the hazard-identification requirements set forth during the initial Necessary and Sufficient Work Smart Standard process. The IFA team makes corrective-action recommendations to the division under review.

The emphasis of the appraisal is directed toward work conducted under or in association with formal work authorizations. By definition, a formal work authorization is required in those cases where hazard levels exceed that of basic line-management authorization. Examples include activity hazard documents (AHDs), radiological work authorizations (RWAs), radiological work permits (RWPs), satellite accumulation areas (SAAs), waste accumulation areas (WAAs), safety analysis documents/final safety analysis documents (SADs/FSADs), discharge permits [sewer, air, etc.], and NEPA/CEQA documents.

Note: Prior to 2001, the IFAs focused on work or areas associated with medium or high levels of concern (LOC), as derived from the Integrated Hazards Assessment (IHA) database. The IHA database has been superseded by the Hazards, Equipment, and Authorization Review (HEAR) database, which does not include a LOC rating. The HEAR system alternatively references formal work authorizations, which translate to operations involving medium to high LOC. Further discussion can be viewed in Chapter 6 of LNBL/PUB-3000.

The objectives of the IFA are to:

- Provide a technical occupational safety and health review of the division's operations, hazards, and controls, especially in the areas where higher hazards are associated with the work performed.
- Validate the basis and status of the formal work authorizations covering the work, including, but not limited to,
 - significant changes in work scope or equipment,
 - o changes in personnel, and
 - training deficiencies.
- Validate the division's current data status within the HEAR database (or equivalent system for tracking division hazards). This includes reviewing the

data for any input errors, and location and personnel changes; and adding new hazards, equipment, and authorizations to the database; followed by division update of the data.

 Inspect division spaces where activities under division self- or linemanagement authorization are conducted. In addition to identifying occupational safety and health concerns, review the operations against the LBNL/PUB-3000 Chapter 6 trigger levels requiring formal work and facility authorizations. As necessary, institute upgrades in safe work authorizations.

1.2 Scope

The Joint Genome Institute (JGI) Production Genomics Facility (PGF) is located in the former Dow Chemical Agricultural Research facilities, constructed in the early 1960s in Walnut Creek, California. The Institute, established on January 1, 1997, is a consortium of scientists, engineers, and support staff from the U.S. Department of Energy's Lawrence Berkeley, Lawrence Livermore, and Los Alamos National Laboratories. The JGI has assumed a significant role in the effort to determine the three billion letters ("base pairs") worth of genetic text that make up the human genome. This international project, the largest biological undertaking in history, promises untold opportunities to understand the basic molecular foundation of life and to improve human health. The PGF consists of 57,000 square feet of laboratory and office space and currently houses approximately 150 researchers and support staff.

1.3 JGI Mission Statement

To develop and exploit new sequencing and other high-throughput, genome-scale and computational technologies as a means for discovering and characterizing the basic principles and relationships underlying the organization, function, and evolution of living systems.

To leverage the unique capabilities of the Department of Energy National Laboratory system to achieve these goals, and to use the resulting understanding to address key DOE missions related to energy, the environment, and human susceptibility.

1.4 Programs

Computational Genomics. The Informatics Group supports PGF sequencing and functional genomics activities, and develops and implements algorithms for annotation, assembly, and comparisons of genomes.

Evolutionary Genomics. Current projects include mouse, sea urchin, fish, and other sequencing projects aimed at understanding gene repertoire

differences between organisms, and at deciphering gene regulatory control elements and networks.

Instrumentation. The PGF relies heavily on automation and complex instrumentation to achieve high-throughput sequencing.

Sequencing for Others. This program provides researchers access to request for special sequencing projects at the PGF.

2 Appraisal Process

2.1 Team

2.1.1 Selection

Given the scope of worked identified and performed at the JGI-PGF, there was a need to assemble a team of EH&S professionals with the technical knowledge to address electrical safety, industrial hygiene, laboratory safety/chemical hygiene, facilities safety, hazardous materials and waste management, ergonomics, and biosafety. The IFA team comprised the following individuals:

- Jeffrey Chung, IFA Team Leader, EH&S
- Matt Kotowski, Safety Engineer, EH&S
- Ken Rivera, DOE Berkeley Site Office
- Bruce King, Biosafety/Industrial Hygienist, EH&S
- Larry McLouth, Chemical/Industrial Hygiene

2.1.2 Member Roles and Responsibilities

Each participating IFA Team member was provided a field appraisal form. This reference and assessment form helped to inventory the individual rooms, authorizations, and hazards throughout the PGF that were to be reviewed during the site visit. The roles and responsibilities of each team member were to focus on assessing the hazards that applied to their field of practice and expertise. Each member was to document his/her findings and other feedback on the field appraisal forms.

2.1.3 Meetings

The team met on April 28, 2003, to go over the logistics of the IFA process for the Genomics Division. The team reviewed the mission,

scope of activities, and inventory of authorizations, and hazards at the JGI-PGF operations, and received copies of the IFA field forms and reference materials for the walkthrough. On the day of the site visit (April 30, 2003), an IFA orientation meeting was arranged for the PGF management. PGF representatives attending the meeting were Sarah Wenning, Don Beaton, and Jimmy Choy. The IFA Team Leader used this session to provide an overview of the IFA's origin, goals, objectives, scope, and focus of the walkthrough. Each management representative was provided a copy of the IFA Team's field appraisal forms. Following the orientation session, a walkthrough of Buildings 100 and 400 ensued. Upon completion of the facility walkthrough, a debriefing session was held to verbally share the preliminary observations, findings, and noteworthy practices encountered by the IFA Team.

2.2 Developing a Hazard Assessment Profile

The IFA initially focused on examining work areas under the auspices of a formal authorization (i.e., Activity Hazard Documents [AHDs], RWAs, SSAs, etc.). There was only one PGF-issued AHD involving embedded laser systems within the commercial ABI sequencing machines. Other formal authorizations, as noted in the HEAR database, include SAA, WAA, and IBC authorizations. All spaces that have been issued an authorization were targeted for appraisal. A risk-based approach was used to identify a representative sample of remaining physical spaces having potentially higher hazard levels. Final selection of venues for the IFA relied on the review of the following documentation and data:

- Scope of work performed by the various PGF programs:
 - Computational Genomics
 - Evolutionary Genomics
 - Instrumentation
 - Sequencing for Others
- SAARs of injuries and illnesses sustained by employees working in the Genomics Division
- Self-assessment report findings
- Hazard information from the HEAR database system
- Ergonomic evaluation reports
- Formal work authorizations, other than AHDs, associated with PGF work (SAAs, WAAs, IBCs, etc.)

- Areas where students are assigned to work
- AHDs issued to the PGF. Only one AHD is currently issued to the PGF, involving embedded laser systems within their ABI sequencing machines. (See Appendices B and C.)

The finalized list of locations identified for IFA walkthroughs is listed in Appendix H.

3 Defining Appraisal Areas

3.1 Formal Work Authorizations

In terms of formal authorizations, one AHD (#2032) was issued to the PGF on May 30, 2002, and approved on December 5, 2002. The AHD is scheduled for renewal on December 5, 2003. The AHD addresses an embedded laser system housed in the new ABI 3730 DNA sequencing machines/units. Other formal authorizations involve hazardous waste management (SAAs) and biosafety use authorization (IBU-B069, B074, B076, B095, B096, and B098). Based on the IFA walkthrough and document review, the AHD's content and the content of the documents generated for the other formal authorizations are current, and operations are adhering to the requirements of the authorizations.

3.2 Validation of Hazard Identification Database (HEAR or Equivalent)

The PGF Safety Coordinator routinely uses the institutional HEAR database to inventory the Division's hazards, equipment, and authorizations. The data are kept current and updated periodically, based on the formal self-assessment inspections of PGF space and other scheduled and informal walkarounds. The Appendices in this report provide various spreadsheets itemizing the content of the HEAR database for the Genomics Division.

3.3 Line Management ('Self-Authorization') Space/Operations

In addition to "authorized" work activities being documented in the HEAR database, Genomics management has also included information on line-management or self-authorized tasks. Rooms that contained hazards, equipment, and ergonomic issues are also detailed in the HEAR database. This information helped to establish the other areas for IFA assessment. Appendix H, IFA Technical Findings, includes results from walkthroughs in self-authorized work areas (technical and non-technical/office space).

4 Findings

Appendix H in this report contains a table that summarizes all identified findings from the IFA walkthroughs of Buildings 100 and 400. Overall, the housekeeping was managed very well. The findings centered mainly in the areas of seismic anchoring of equipment and chemical hygiene/lab safety.

- During the IFA space reviews, the team encountered occasional safety issues requiring attention: housekeeping, seismic safety, lab safety, chemical labeling/storage, and workstation ergonomics. Many of these findings were responded to quickly and corrected.
- More involvement in periodic safety walkarounds by department heads, group leaders, and supervisors would create visibility and stimulate greater dialogue between employees and management. Such ongoing efforts and visible presence help to engage the worker in communication and feedback, as well as reinforce consistent safe work practices.

Over the past two self-assessment performance years, the Genomics Division has experienced above-average total recordable case (TRC) rates and days away or restricted-workday rates, resulting in "improvement needed" (red) performance ratings for this self-assessment metric. This pattern occurred again in the current performance year. Although the number of SAARs increased this year, the severity of the cases has lessened (no days away from work). This improvement reflects the commitment and safety management system in place to encourage early reporting and medical assistance. The types of engineering and administrative controls are also making a positive impact in eliminating recurrence of similar injuries. However, challenges in the employee-relations area may require further assessment, because they may be affecting the injury experience/ performance. A proactive strategy is needed to assess the risk exposures of other job tasks to prevent injuries from occurring rather than to prevent recurrence. This is where the line management/supervisors must be proactively involved and not consider safety as a collateral responsibility.

The dynamic nature of the PGF environment occasionally creates an unsteady supervisory environment. An employee could be suddenly thrust into a supervisory role one day and returned to employee status the next day. A more robust system for supervisor preparation and participation in safety is needed to assure consistency in implementation of the PGF safety program. There is variability, based on the level of formal preparation, in the manner by which supervisors engage their subordinates and take on their responsibilities to oversee safety in their assigned areas.

EH&S 20 should be a requirement for all entry-level and current supervisors. Some form of job safety analysis (JSA) training would be beneficial, a

refresher course in SAAR investigation would be helpful, and safety performance accountability are necessary to reinforce the importance of proactive oversight and management of workplace safety.

5 Noteworthy Practices

- Top management commitment is becoming more visible, and a formal written safety communication (e-mail) has been issued by the new Division Director. Responsibility, accountability, and mitigation are emerging messages delivered by management.
- The Safety Coordinator position is becoming more integrated and interactive throughout the PFG operation and organizational hierarchy. The EH&S Division continues to service the Division by providing ES&H support through its Liaison Program, as well as technical subject matter experts as needed.
- PGF management took the initiative to schedule and enroll all of their managers and supervisors in a tailored EH&S 20 course (EH&S for Supervisors).
- The Division's ISM Plan was reviewed and revised by JGI-PGF management to reflect a more tailored approach in managing ES&H issues.
- JGI has sound biosafety practices for its biosafety level-one biological work.
 Examples include:
 - Personnel receive general biosafety training at LBNL.
 - Eating and drinking is not allowed in the lab areas. Designated break areas, lockers, and/or offices are provided for personal activities and eating/drinking.
 - "Risk group 1" biological waste is autoclaved on site, as required for recombinant biological waste. The autoclave operation and reliability is properly documented and tested.
 - JGI-PGF is correctly managing the certification of the biosafety cabinet in Room 416 (certified by TSS on January 23, 2003).
 - JGI-PGF routinely registers new biological work via the LBNL biosafety registration process.
 - JGI-PGF routinely and properly managed the transfer of "select agents" in 2001–2002, when previous select-agent regulations applied to some of the work at the facility.

- Engineering solutions to sequencing work are also noteworthy. The Megabace 1000 and 4000 units, with their of manually intensive sequencing tasks, have been replaced by highly automated ABI 3730 machines.
- Management is taking a proactive approach in the design of warning notices and labels for newly fabricated equipment. See the example below:





- The Division has chosen to make all supervisors enroll in and attend a tailored EH&S 20 training program (EH&S for Supervisors).
- Management has sent a memo to all employees reaffirming commitment to safety.
- The Division is driving down the severity of injuries and illnesses.
- The Division is using institutional database systems (HEAR and LCATS) to inventory workplace hazards and track corrective-action efforts.

6 Conclusion

PGF management has made some positive strides toward commitment to, and management of, high hazard areas and systems within its operations. The higher-hazard areas and sequencing processes are being re-engineered and improved to use automation more effectively rather than rely on manual effort. JGI-PGF personnel are striving to demonstrate a visible and active commitment to safety. ES&H leadership is emerging, and young supervisors

are taking a more proactive role toward workplace safety. A more enhanced system to prepare supervisors to become strong advocates and stewards of worker safety needs to be developed. Accountability is being further established.

There is a very good chemical labeling and tracking program in place, and housekeeping (an index of safety consciousness) is generally very good. The safety engineering controls are beginning to make a sustainable impact on worker safety.

Appendices

- Appendix A. PGF Self-Assessment "At-A-Glance" Results, 2002
- Appendix B. Genomics HEAR Database 2003: Hazard Profile [Building 100]
- Appendix C. Genomics HEAR Database 2003: Hazard Profile [Building 400]
- Appendix D. Rooms Containing Hazards/Equipment Assigned to Genomics Division [Building 100]
- Appendix E. Rooms Containing Hazards/Equipment Assigned to Genomics Division [Building 400]
- Appendix F. Rooms Containing Ergonomic Issues Assigned to Genomics Division
- Appendix G. PGF I&I Experience (thru 6/30/03) and Safety Communication
- Appendix H. IFA Technical Findings

Appendix A. PGF Self-Assessment "At-A-Glance" Results, 2002

Criteria	Expectations	Division
1	Evidence of strong ES&H communication	Yes
	ISM plan is reviewed and updated annually	Yes
2	% Hazard review performed for formal authorizations and self-authorized work	Partial
	% Work space inspected	100%
	% Engineering controls certified and calibrated	100%
3	Evidence of an effective ergonomics program	Yes
	L/M participating in assessment (i.e., regular walthroughs)	Yes
	% Authorized work w/o major deficiencies	100%
	% SAAs in compliance	98%
	% QA compliance rate	100%
	# NCARs	0
4	Injury & accident case rate (TRC)	4.7
	Lost workday case rate (LWC)	4.7
	% Job hazard questionnaire (JHQ) completed	98%
	% Completion rate of required courses	91%
	Waste minimization (haz., rad., & mixed)	Yes
	LCATS completion rate	Partial
5	evidence of active safety management group	Yes
	SAARs properly completed	Yes
	Division Score	89.5%

Appendix B. Genomics IFA - 2003 - HEAR Database: Hazard Profile [Building 100]

Bldg.	Room	Resp. Person	Project	Authorization	Hazard Type											
					Non-I Rad	Chem-Haz	Chem-Flam	Lasers	Ergo	Comp. Gas	Cryogen	P>150 psi	HazWaste	Thermal	Biohaz	⊟ect.
100	100	Vertica. Carolyn	PGF Labby Office						Х							
100	103D	Osolin, Charles	Office Space						Х							
100	106	McFarland, Sandra	Office Space						Х							
100	0108D	Chaparro, Sandra	Office Space						X							
100	0108E	Turturice, Jeanne	Office Space													
100	120	Lucas, Susan	Production Sequencing Lab Mega	AHD, IBC-B076				X-AHD		Х		Х			X-IBC	
100	122	Lucas, Susan	Rolling Orde Amplification Lab	SAA, IBC-B076			X-SAA						X-SAA		X-IBC	
100	123	Zhang, Qing	Office Space						Х							
100	126	Copeland, Alex	Office Space						Х							
100	127	Slater, Nathaniel	Office Space						Х							
100	134	Kadner, Kristen	Office Space						Х							
100	136	Baumohol, Jason	Office Space						X							
100	138	Kimball, Heather	Office Space						X							
100	139	Lucas, Susan	Libraries Lab	SAA, IBC-B076	X	Х	X-SAA						Х		X-IBC	
100	140	Lucas, Susan	RCA Process Lab	IBC-B076			Х								X-IBC	
100	141	Lucas, Susan	Thermal Cycling Lab	IBC-B076			Х								X-IBC	
100	144	Lucas, Susan	Libraries Lab	SAA, IBC-B076			X-SAA						Х		X-IBC	
100	145	Lucas, Susan	Gel Imaging Room			Х										
100	149	Lucas, Susan	QC Production Sequencing Lab	AHD,SAA, IBC-B076		Х	X-SAA	X-AHD	Х	Х			Х		X-IBC	
100	150	Lucas, Susan	Production Sequencing Lab ABI	IBC-B076				Х							X-IBC	
100	156	Martin, Joel	Office Space						Х							

Appendix C. Genomics IFA - 2003 - HEAR Database: Hazard Profile [Building 400]

Bldg.	Room	Resp. Person	Project	Authorization						Hazard Ty	pe					
					Non-I Rad	Chem-Haz	Chem-Flam	Lasers	Ergo	Comp. Gas	Cryogen	P >150 psi	HazW aste	Thermal	Biohaz	Elect.
400	403	Johnson, Laura	Office Space						х							
400	409	Ho, Isaac	Office Space						Х							
400	412	Keys, David	Functional Genomics	SAA		Х	Х						X-SAA			
400	413	Keys, David	Functional Genomics	SAA		Х	Х						X-SAA			
400	416	Richardson, Paul	Functional Genomics	SAA, IBC-B098		Х	X-SAA			Х	Х		X-SAA		X-IBC	
400	0421A	Sanders, Brent	Office Space						х							
400	0421D	Hornick, Leila	Office Space						Х							
400	0421H	Padki, Anuradha	Office Space						х							
400	424	Waage, Cary	Office Space						х							
400	426	Hajek, Patrick	Office Space						х							
400	427	Kale, Patricia	Office Space						Х							
400	428	Yumae, Brian	Office Space						Х							
400	429	Peters, Linda	Office Space						Х							
400	430	Trong, Stephan	Office Space						Х							
400	431	Rash, Sam	Office Space						х							
400	432	Kobayashi, Art	Office Space						Х							
400	437	Medina, Monica	Office Space						Х							
400	439	Puget, Francino	Office Space						х							
400	439	Pilar, Maria	Office Space						х							
400	440	Martinez, Diego	Office Space						Х							
400	441	Goodstein, David	Office Space						Х							
400	442	Aerts, Andrea	Office Space						х							
400	445A	Bensasson, Douda	Office Space						х							
400	445B	Yang, Yau-Wen	Office Space						х							
400	445D	Hellsten, Uffe	Office Space													
400	446	Boore, Jeffrey	Functional Genomics	SAA, IBC-B095,		Х	Х						X-SAA		X-IBC	
				B-096, B069												
400	449	Detter, Chris	Storage Room			Х										
400	457	Richardson, Paul	Functional Genomics	IBC-B074		Х	х					Х		Х	X-IBC	
400	458	Richardson, Paul	Functional Genomics	AHD, IBC-B074		Х	Х	X-AHD		Х			X-SAA		X-IBC	
400	459	Richardson, Paul	Functional Genomics	SAA, IBC-B074		Х	X-SAA						Х	Х	X-IBC	
400	461	Keys, David	Office Space						х							
400	466	Murphy, Michael	Office Space						х							

Appendix D. Rooms Containing Hazards/Equipment Assigned to Genomics Division

Building 100	Project	Resp. Person	Comments								
Room 103D	Office Space	Osolin, Charles									İ
Room 106	Office Space	McFarland, Sandra									
Room 107	Office Space	Catino, Grace									
Room 108A	Office Space	Nichols, Nora									
Room 108B	Office Space	Bruzzone, Carol									
Room 108C	Office Space	Smith, Karen									
Room 108D	Office Space	Chaparro, Sandra									
Room 108E	Office Space	Turturice, Jeanne									
Room 108F	Office Space	Hom, Wendell									
Room 0119	Engineering Lab	Pollard, Martin									
Room 0120	Production Sequencing Lab - Mega	Lucas, Susan									
Room 0121	Instrument Support Lab	Lucas, Susan									
Room 0122	Rolling Circle Amplication Lab	Lucas, Susan									
Room 0123	Office Space	Zhang, Qing									
Room 0126	Office Space	Copeland, Alex									
Room 0127	Office Space	Slater, Nathaniel									
Room 0128	Office Space	Lou, Yunian									
Room 0134	Office Space	Kadner, Kristen									
Room 0136	Office Space	Baumohl, Jason									
Room 0138	Office Space	Kimball, Heather									<u> </u>
Room 0139	Libraries Lab	Lucas, Susan									<u> </u>
Room 0140	RCA Process Lab	Lucas, Susan									
Room 0141	Thermal Cycling Lab	Lucas, Susan									
Room 0142	Media Prep Room	Lucas, Susan									
Room 0143	Glass Washing Room	Lucas, Susan									
Room 0144	Libraries Lab	Lucas, Susan									
Room 0145	Gel Imaging Room	Lucas, Susan									
Room 0146	Equipment Room	Lucas, Susan									
Room 0147	Mechanical Room/Shipping	Beaton, Don									
Room 0149	QC Production Sequencing Lab	Lucas, Susan									
Room 0150	Production Sequencing Lab - ABI	Lucas, Susan									
Room 0156	Office Space	Martin, Joel									i

Appendix E. Rooms Containing Hazards/Equipment Assigned to Genomics Division

Building 400	Project	Resp. Person	Comments									
Room 0403	Office Space	Johnson, Laura										
Room 0409	Office Space	Ho, Isaac										
Room 0412	Functional Genomics	Keys, David										П
Room 0413	Functional Genomics	Keys, David										
Room 0416	Functional Genomics	Richardson, Paul										
Room 0418	Autoclave Room	Chaparro, Sandra										П
Room 0421	Office Space	Huang, Katherine										
Room 0421A	Office Space	Sanders, Brent										
Room 0421D	Office Space	Hornick, Leila										
Room 0421H	Office Space	Padki, Anuradha										
Room 0424	Office Space	Waage, carey										
Room 0426	Office Space	Hajek, Patrick										
Room 0427	Office Space	Kale, Patricia										
Room 0428	Office Space	Yumae, Brian										Ш
Room 0429	Office Space	Peters, Linda										Ш
Room 0430	Office Space	Trong, Stephan										Ш
Room 0431	Office Space	Rash, Sam										
Room 0432	Office Space	Kobayashi, Art										\Box
Room 0437	Office Space	Medina, Monica										Ш
Room 0439	Office Space	Puget, Francino										
Room 0439	Office Space	Pilar, Maria										
Room 0440	Office Space	Martinez, Diego										
Room 0441	Office Space	Goodstein, David										
Room 0442	Office Space	Aerts, Andrea										
Room 0445A	Office Space	Bensasson, Douda										
Room 0445B	Office Space	Yang, Yau-W en										
Room 0445D	Office Space	Hellsten, Uffe										
Room 0446	Genomic Diversity	Boore, Jeffrey										
Room 0449	Storage Room	Detter, Chris										
Room 0451	Equipment Room	Richardson, Paul										
Room 0457		Richardson, Paul										П
Room 0458	Functional Genomics	Richardson, Paul										
Room 0459	Functional Genomics	Richardson, Paul										\Box
Room 0461	Office Space	Keys, David										П
Room 0466	Office Space	Murphy, Michael										\square

Appendix F. Rooms Containing Ergonomic Issues Assigned to Genomics Division (update as of 4/24/2003)

Building 100	Project	Resp. Person	Comments
Room 0100	PGF Lobby	Vertuca, Carolyn	
Room 0103D	Office Space	Osolin, Charles	
Room 0106	Office Space	McFarland, Sandra	
Room 0108D	Office Space	Chaparro, Sandra	
Room 0108E	Office Space	Turturice, Jeanne	
Room 0123	Office Space	Zhang, Qing	
Room 0126	Office Space	Copeland, Alex	
Room 0127	Office Space	Slater, Nathaniel	
Room 0134	Office Space	Kadner, Kristen	
Room 0136	Office Space	Baumohl, Jason	
Room 0138	Office Space	Kimball, Heather	
Room 0156	Office Space	Martin, Joel	
Building 400	Project	Resp. Person	Comments
Room 0403	Office Space	Johnson, Laura	
Room 0409	Office Space	Ho, Isaac	
Room 0421A	Office Space	Sanders, Brent	
Room 0421D	Office Space	Hornick, Leila	
Room 0421H	Office Space	Padki, Anuradha	
Room 0424	Office Space	W aage, carey	
Room 0426	Office Space	Hajek, Patrick	
Room 0427	Office Space	Kale, Patricia	
Room 0428	Office Space	Yumae, Brian	
Room 0429	Office Space	Peters, Linda	
Room 0430	Office Space	Trong, Stephan	
Room 0431	Office Space	Rash, Sam	
Room 0432	Office Space	Kobayashi, Art	
Room 0437	Office Space	Medina, Monica	
Room 0439	Office Space	Puget, Francino	
Room 0439	Office Space	Pilar, Maria	
Room 0440	Office Space	Martinez, Diego	
Room 0441	Office Space	Goodstein, David	
Room 0442	Office Space	Aerts, Andrea	
Room 0445A	Office Space	Bensasson, Douda	
Room 0445B	Office Space	Yang, Yau-W en	
Room 0445D	Office Space	Hellsten, Uffe	
Room 0461	Office Space	Keys, David	
Room 0466	Office Space	Murphy, Michael	

PGF I&I Experience (thru 6/30/03)



Self-Assessment Year (7/1/2000 – 6/30/2001):

 $TRC = 13.10_{S/A \cdot 99-00}$

2 Recordables: Ergo-RMIs <u>Uncapping</u>: Hands-Fingers

1 First Aid: Ergo- Strain Media Plates/Matrix Tubes

TRC = 3.74 LBNL-ONLY 13 lost days / 91 restricted days

Self-Assessment Year* (7/1/2001 – 6/30/2002):

3 Recordables: Ergo - RMIs <u>Uncapping</u>: Fingers-Hand-Elbow

3 First Aids: Ergo - Strain Vials/Matrix Tubes/Equipment

TRC = 3.74 LBNL-ONLY 53 lost days /137 restricted days

Self-Assessment Year (7/1/2002 – 6/30/2003):

4 Recordables: Biomech & Chem Sitting Posture/Splash in Eye/Lifting

3 First Aids: Ergo & Chem Computer/Droplet in Eye/Contusion

0 lost days / 15 restricted days

TRC = 4.78 All Hours Worked (LBNL + LLNL)

(Projected to 12 months)

Jeffrey Chung (x5818) 1

Appendix G - Part II

Reproduction of Safety Message E-mailed to PGF employees =

February 19, 2003

TO: All PGF Employees

FROM: Eddy Rubin, JGI Director

RE: Commitment to PGF Workplace Safety

The PGF received a "Needs Improvement" rating (red color) for last year's Self-Assessment performance (7/1/01 - 6/30/02) involving the Injuries and Accident metric. We experienced three (3) recordable work injuries (those that resulted in our employees receiving more than first aid assistance). During the first seven months of this current Self-Assessment performance year (7/1/02-6/30/03), 5 PGF employees experienced work-related injuries: 2 computer-related, 2 splashes of solutions to the eyes and one pipetting overuse. Again, three (3) of these cases required medical treatment beyond first aid assistance and puts us at par with last year's performance. I am concerned about this pattern and seek your help to improve our worker safety performance.

I'm committed to creating and maintaining a safe workplace for all PGF staff. Safety plays an integral part in the quality of work life and it will facilitate the effectiveness and success of our mission. Both employees and supervisors play a vital role in creating and ensuring a safe work environment.

Please keep safety in mind when performing activities at PGF. Do not conduct work without understanding/recognizing the hazards, communicating safety concerns, establishing the proper controls, obtaining the necessary training, and eliminating the atrisk behaviors. I welcome your suggestions and strategies for improving workplace safety and health.

Let's strive for "ZERO Accidents" through June 30th!

Eddy Rubin, MD, PhD
Director, Joint Genome Institute
Genome Sciences Division
Lawrence Berkeley National Laboratory
1 Cyclotron Road, MS 84-171
Berkeley, CA 94720
510-486-5072
510-486-4229 Fax
emrubin@lbl.gov

Appendix H. IFA Technical Findings

Location (Bldg/Room)	Responsible Supervisor	Findings
100-119	Marty Pollard	Material stored in the hood in a manner that blocked the baffles. Materials need to be relocated.
		SAFEAIRE fume hood was tripped and not operating, and the alarm was muted. The duration of inoperability could not be determined; there was no action to by the user(s) to repair until identified by the IFA Team.
		The freestanding dairy case and incubator need seismic tie downs.
		An emergency chemical spill kit was stored on a high shelf and inaccessible. This kit needs to be located at a readily accessible and visible area.
100-122	Susan Lucas	A flammable liquid (concentration – 70% alcohol) was stored in a domestic refrigerator. Flammable liquids need to be stored in properly designed/explosion-proof refrigerators.
		Secondary containment is recommended for chemical glass containers that are stored in the refrigerator.
100-139	Susan Lucas	 One biological waste can was lined with a clear autoclave bag that had a sign indicating "Only Genomic DNA from Select Agents to be Autoclaved." The sign needs to be removed from the biological waste container. Note: In January 2003, JGI and EH&S agreed that the new CDC and USDA regulations on select agents are not applicable to currently approved work at the PGF.
		It is recommended that eye protection be routinely used whenever employees transfer e-coli solutions into small vials. Employees performing this task were not wearing any eye protection.
100-140	Susan Lucas	The water source signage needs to be clarified on the ice machine. Although the signage indicates "industrial water," the ice machine is connected to the domestic/potable water line.
100-142	Susan Lucas	The wall switch near the emergency eyewash/shower needs a weatherproof cover.
		The autoclave in this room needs to be added to the HEAR database inventory.
100-144	Susan Lucas	The freestanding REVCO deli case needs seismic anchoring.

Appendix H. IFA Technical Findings

Location (Bldg/Room)	Responsible Supervisor	Findings
100-146	Susan Lucas	The wall switch near the emergency eye wash/shower needs a weatherproof cover.
		The door of the corrosive chemical storage cabinet under the fume hood will not close.
100-149*	Susan Lucas	• From an ergonomic standpoint, the height of the computers is high relative to the users' sitting height. If computer use increases from occasional to continuous, lowering of the computer workstations is recommended.
400-412	David Keys	The freestanding refrigerator needs seismic tie-downs.
		 Iso amyl alcohol is a peroxidizable compound. The control procedures in the Chemical Hygiene and Safety Plan need to be followed (testing, labeling, disposal, etc.) If the container tests positive, or is of unknown age/history, or has exceeded its shelf life, DO NOT open the container or disturb it. Contact Larry McLouth at x5286.
400-416A	David Keys	 Fomenting Room: The freestanding ISOTEMP refrigerator storage unit needs to be seismically anchored.
400-418	Sandra Chaparro	 Prepare a standard operating procedure for the autoclave operator to assure that the cool- down cycle is followed before accessing autoclaved glassware.
400-446	Jeffrey Boore	• Sodium chlorate is stored in a corrosive storage cabinet next to sulfuric acid. These compounds are incompatible and need to be physically stored away from one another. H ₂ SO ₄ and NaClO ₃ would be an explosive mixture that liberates chlorine dioxide gas.
		 The need for NaClO₃ should be evaluated. If it is still needed, store it away from combustible and flammable materials (it is also an oxidizer). Review the product's MSDS for additional storage guidelines.
		 Glacial acetic acid should be removed from the corrosive cabinet and stored as a flammable liquid.
400-451	Paul Richardson	Liquids spilled on the floor should be wiped up and not left on the floor.
400-459	Paul Richardson	Glacial acetic acid should be moved from the corrosive cabinet and stored as a flammable liquid.

Appendix H. IFA Technical Findings

Other Findings/Issues/Recommendations:

- All high-speed and ultra-speed centrifuges need to have a system in place to track and de-rate rotor use over time.
- Emergency eyewashes and shower units are being flush-tested every six months by the Operations/Facilities
 Group and documented on the inspection tags. According to the LBNL Work Smart Standards set of
 requirements, testing frequency needs to be quarterly. Testing of these units need to be switched from every six
 months to a quarterly schedule. The requirement is further explained in the LBNL Chemical Hygiene and Safety
 Plan (see Emergency Procedures and Equipment section).
- Lab fume hoods throughout the PGF have stickers indicating that Technical Safety Services (TTS) had tested the airflow of the hoods in September 2002. Since LBNL EH&S Division's Industrial Hygiene Group surveys the flow of hoods annually, TSS testing is not necessary.
- The emergency first aid kits need to be periodically checked to assure they are adequately stocked. A simple visual check is to determine if the seal has been broken.